

**REMARKS**

**Information Disclosure Statement:**

Applicant thanks the Examiner for initialing and returning Form PTO-1449 filed on December 2, 2002, thus indicating that all of the references listed thereon have been considered.

**Claim Amendment:**

Applicant has amended claim 31, as shown in the previous section, to correct the dependency of this claim. Originally, claim 31 depended on claim 29. However, claim 31 more appropriately depends on claim 30, as both claims are directed to a "detonative engine."

Applicant notes that the above referenced claim amendment has been made to merely clarify the claimed invention and is not intended to narrow the original scope or spirit of the claim 31.

**Claim Rejections:**

Claims 1-31 are all the claims pending in the application, and currently all of the claims stand rejected.

***35 U.S.C. § 112, 2<sup>nd</sup> Paragraph Rejection - Claims 3 and 14:***

Claims 3 and 14 stand rejected under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph as being indefinite. Specifically, the Examiner has indicated that there is no antecedent basis for the "rear pulse

detonation engines.” In view of the following discussion, Applicant respectfully traverses the above rejection.

Applicant submits that in each of the claims 3 and 14 the “rear pulse detonation engines” are in addition to the “pulse detonation engines” which are positioned near the front of the wing. Specifically, claim 3 depends on claim 2, which indicates that the “pulse detonation engines” of claim 1 are distributed along the leading edge of the airfoil. Further, claim 3 identifies “a plurality of rear pulse detonation engines.” In view of this, the “rear pulse detonation engines” are different than the “pulse detonation engines” of claim 1. Thus, Applicant submits that claim 3 (and claim 14 for similar reasons) are clear and definite.

In view of the foregoing, Applicant hereby submits that claims 3 and 14 are clear and definite, and accordingly requests the Examiner reconsider and withdraw the above referenced rejection of these claims.

***35 U.S.C. § 103(a) Rejection - Claims 1-6, 8-18, 20-23, 25-29 and 31:***

Claims 1-6, 8-18, 20-23, 25-29 and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,505,443 to Bradfield et al. in view of U.S. Patent No. 6,439,503 to Winfree et al. In view of the following discussion, Applicant hereby traverses the above rejection.

Applicant notes that Bradfield is directed to an in-wing propulsion system for a V/STOL aircraft. Specifically, as shown in Figures 1 and 3-5, Bradfield discloses placing a plurality of turbofan engines within each of the wings, where the thrust of the engines can be vectored to

allow for short take-off and vertical landing of the aircraft. As recognized by the Examiner, there is no disclosure, whatever, regarding the use of pulse detonation engines.

In an effort to cure this deficiency, the Examiner relies on Winfree. Winfree discloses a cluster 11 of PDE's, where the PDE's in the cluster share a common inlet. With this disclosure, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to "incorporate the use of PDE's into the aircraft of Bradfield et al. as an art recognized alternate means of providing thrust." *See* Office Action, page 3.

Applicant respectfully disagrees with the Examiner. Namely, Applicant submits that there is no motivation, whatever, of using PDE's in the Bradfield aircraft, and thus one of ordinary skill in the art would not have found it obvious to combine the teachings of Bradfield with Winfree. Specifically, Applicant submits that one of ordinary skill in the art would recognize that the use of pulse detonation engines (i.e. PDEs) would not be desirable to provide thrust to a V/STOL aircraft during either landing or taking off. As recognized by Winfree, PDEs are more appropriately used at higher Mach numbers to provide additional thrust more efficiently than a typical turbofan or turbojet engine. *See* Winfree, col. 1, lines 21-24. However, at lower thrust levels, particularly at low subsonic speeds, the use of PDEs would not be desirable as the primary, or only, source of thrust, particularly on a V/STOL aircraft.

Moreover, because of the pulsing nature of the thrust in PDEs, one of ordinary skill in the art would recognize that their use would be undesirable as a source of thrust in a V/STOL aircraft. It is recognized that the thrust needed for both takeoff and landing of a V/STOL aircraft should be constant, as that provided by a turbofan engine as described in Bradfield.

Additionally, it is recognized that during other portions of the flight envelope of a V/STOL aircraft, for example approaching hover or other low speed maneuvers, requires relatively low thrust. Thus, one of ordinary skill in the art would not be motivated to either replace or augment the turbofan engines of Bradfield with a pulse detonation engine, as described in Winfree, because doing so would greatly inhibit, or otherwise adversely affect, the operation of the Bradfield aircraft as a V/STOL aircraft.

In view of the foregoing, Applicant submits that one of ordinary skill in the art would not combine the teachings of Bradfield and Winfree as suggested by the Examiner. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness under the provisions of 35 U.S.C. § 103(a), with regard to claims 1 and 21. Further, as claims 2-6, 8-18, 20, 22-23, and 25-29 depend on claims 1 and 21, respectively, Applicant submits that these claims are also allowable, at least by reason of their dependence.

Applicant notes that the dependency of claim 31 has been changed, and thus claim 31 is not indicated above.

***35 U.S.C. § 103(a) Rejection - Claims 7 and 24:***

Claims 7 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bradfield in view of Winfree, in further view of U.S. Patent No. 5,896,742 to Black. However, as these claims depend on claims 1 and 21, respectively, and because Black fails to cure the deficient teachings of both Bradfield and Winfree, Applicant submits that these claims are also allowable, at least by reason of their dependence.

***35 U.S.C. § 103(a) Rejection - Claim 19:***

Claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bradfield in view of Winfree, in further view of U.S. Patent No. 5,901,550 to Bussing et al. However, as claim 19 depends on claim 1, and because Bussing fails to cure the deficient teachings of both Bradfield and Winfree, Applicant submits that this claim is also allowable, at least by reason of its dependence.

***35 U.S.C. § 103(a) Rejection - Claim 30:***

Claims 30 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bussing in view U.S. Patent No. 5,909,475 to Wells et al. In view of the following discussion, Applicant respectfully traverses the above rejection.

In rejecting claim 30, the Examiner relies on Bussing to teach a cluster of PDE's (see Figures 6A and 6B), and Wells to teach having the PDE's in a honeycomb pattern and having at least one PDE with a hexagonal shape.

Wells is directed to a container for spent nuclear fuel rods, and has no disclosure of discussion regarding PDE's. The Examiner states that Wells teaches using a honeycomb pattern as a space saving configuration, and asserts that it would have been obvious to use a similar configuration for PDE's. Applicant respectfully disagrees. Specifically, Applicant submits that simply because configured nuclear rods in a honeycomb pattern is a space saving measure does not mean that it would be obvious to do so with pulse detonation engines. Namely, because of the aerodynamic interactions at the exit nozzles of the PDE's, one of ordinary skill in the art would not look to nuclear fuel rod configurations (as those in Wells) to determine how to configure clustered PDE's.

Moreover, even assuming, *arguendo*, that the Examiner's comments were to be true, and it was assumed that one would combine the teachings of Wells with Bussing, there is no teaching or suggestion in either reference to make a PDE with a hexagonal shape. As shown in Bussing, all of the PDE's are cylindrical shape, and there is no teaching or suggestion of making a PDE with a hexagonal shape. Namely, there is no disclosure whatever, that a hexagonal shape would function as disclosed in Bussing, nor is there a specific teaching to try a hexagonal shape.

In view of the foregoing, Applicant submits that one of ordinary skill in the art would not combine the teachings of Bussing and Wells as suggested by the Examiner. Further, even if one of ordinary skill in the art would attempt to make the above combination, the present invention would not result. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness under the provisions of 35 U.S.C. § 103(a), with regard to claim 30. Further, as amended claim 31 depends on claim 30, Applicant submits that this claim is also allowable, at least by reason of its dependence.

**Conclusion:**

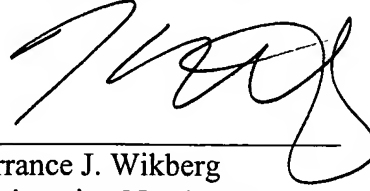
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

RESPONSE UNDER 37 C.F.R. § 1.111  
U.S. Application No.: 10/065,815

Our Ref.: A8697  
Art Unit: 3641

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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